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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/855,750	05/16/2001	Madhavan Nampoothiri K.	32301WD1181	8888

7590 11/03/2004

SMITH GAMBRELL & RUSSELL, L.L.P.
Suite 800
1850 M Street, N.W.
Washington, DC 20036

EXAMINER	
STEADMAN, DAVID J	

ART UNIT	PAPER NUMBER
1652	

DATE MAILED: 11/03/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/855,750	NAMPOOTHIRI K. ET AL.	
	Examiner	Art Unit	
	David J Steadman	1652	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *31 August 2004*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *25-27 and 29-46* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☒ Claim(s) *25-27,29,31-35,40,41,43 and 44* is/are allowed.

6)☒ Claim(s) *30,36-39,42,45 and 46* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *16 May 2001* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☒ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☒ Certified copies of the priority documents have been received in Application No. 09/577,848.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Status of the Application

[1] Claims 25-27 and 29-46 are pending in the application.

[2] Applicants' amendment to the claims, filed August 31, 2004, is acknowledged. This listing of the claims replaces all prior versions and listings of the claims.

[3] It is noted that the text of canceled claim 47 recites additional text that was not present in claim 47 of the amendment filed May 12, 2003.

[4] Applicants' arguments filed on August 31, 2004 have been fully considered and are deemed to be persuasive to overcome some of the rejections and/or objections previously applied. Rejections and/or objections not reiterated from previous office actions are hereby withdrawn.

[5] The text of those sections of Title 35, U.S. Code not included in the instant action can be found in a prior Office action.

[6] The indicated allowability of claims 30, 36-39, 42, 45-46 is withdrawn in view of the new rejections stated below.

Priority

[7] Applicants' claim to domestic priority under 35 USC 120 to US non-provisional application 09/577,848, filed May 25, 2000, is acknowledged. Applicants' claim to foreign priority under 35 USC 119(a)-(d) to German application 100 21 831.8, filed March 04, 2000, is acknowledged. The German priority document is filed in application 09/577,848.

Oath/Declaration

[8] It is noted that the first paragraph of the specification states the instant application claims priority under 35 U.S.C. 119 to German Patent Application 10021831.8, filed May 04, 2000, while the Declaration filed August 31, 2001 states the instant application claims priority to the same German Patent Application with a filing date of March 04, 2000. Clarification is requested and, if necessary, the appropriate correction is required.

Specification/Informalities

[9] The title of the invention is not descriptive. A new title is required that is clearly indicative of the invention to which the claims are directed. The following title is suggested: --*fadD15* Gene Encoding An Acyl-CoA Synthase--.

[10] The specification is objected to as being confusing in that SEQ ID NO:1 does not encode the polypeptide of SEQ ID NO:2 as disclosed in the specification. The codon encoding the first amino acid of SEQ ID NO:2, a methionine, is the triplet TTG. Also, the sequence listing for SEQ ID NO:1 shows that the first encoded amino acid, a methionine, is encoded by the triplet TTG. However, it is well known in the art that the codon TTG encodes a leucine and not a methionine. Clarification is requested.

Claim Objection

[11] Claim 46 is objected to under 37 CFR 1.75 as being a substantial duplicate of claim 31. When two claims in an application are duplicates or else are so close in content that they both cover the same thing, despite a slight difference in wording, it is proper after allowing one claim to object to the other as being a substantial duplicate of the allowed claim. See MPEP § 706.03(k).

Claim Rejections - 35 USC § 112, Second Paragraph

The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

[12] Claim(s) 30, 42, and 45-46 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

[a] Claims 30, 42, and 45 are confusing in that it appears from claims 30 and 42 that Deposit DSM 13249 is a vector. However, from the specification, it appears that Deposit DSM 13249 is a host cell (see pp. 18 and 25-26 of the specification). It is suggested that applicants clarify the meaning of the claims.

[b] Claim 46 is unclear as to the intended acyl-CoA synthase that is encoded by the degenerate variant of nucleotides 247-2103 of SEQ ID NO:1. From the specification it appears that nucleotides 247-2103 of SEQ ID NO:1 encode the polypeptide of SEQ ID NO:2 (see SEQ ID NO:1 and 2 of the sequence listing). Thus, a degenerate variant of SEQ ID NO:1 would necessarily encode SEQ ID NO:2. However, it is not clear from the

claims and specification as to whether this is the case, *i.e.,* that the scope of degenerate variants encoded by nucleotides 247 to 2103 of SEQ ID NO:1 is limited to encoding SEQ ID NO:2. The examiner has interpreted the claim as meaning the degenerate variant encodes the acyl-CoA synthase of SEQ ID NO:2. Clarification of the intended encoded acyl-CoA synthase is requested.

Claim Rejection - 35 USC § 112, First Paragraph

The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

[13] Claim(s) 36-39 are rejected under 35 U.S.C. 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

Claim 36 (claim 37 dependent therefrom) is drawn to a genus of isolated polynucleotides consisting of at least 15 consecutive nucleotides of SEQ ID NO:1 or the complement thereof, wherein the polynucleotide is a PCR primer for synthesis of an acyl-CoA synthase-encoding nucleic acid. Claim 37 (claim 38 dependent therefrom) is drawn to a genus of isolated polynucleotides consisting of at least 15 consecutive nucleotides of SEQ ID NO:1 or the complement thereof, wherein the polynucleotide is a hybridization probe for isolation of an acyl-CoA synthase-encoding nucleic acid. Claims

36-37 recite the transitional phrase "consisting of." However, in view of the inclusion of "at least" in claims 36-37, the recited genus of polynucleotides is not limited to a fragment of SEQ ID NO:1, but instead encompasses any polynucleotide with *at least* 15 nucleotides of SEQ ID NO:1 and any additional sequence. In accordance with MPEP 2111, the claims have been interpreted as encompassing not only nucleic acid fragments, but also full-length polynucleotides. For claims drawn to a genus, MPEP § 2163 states the written description requirement for a claimed genus may be satisfied through sufficient description of a representative number of species by actual reduction to practice, reduction to drawings, or by disclosure of relevant, identifying characteristics, i.e., structure or other physical and/or chemical properties, by functional characteristics coupled with a known or disclosed correlation between function and structure, or by a combination of such identifying characteristics, sufficient to show the applicant was in possession of the claimed genus. MPEP § 2163 states that a representative number of species means that the species which are adequately described are representative of the entire genus. Thus, when there is substantial variation within the genus, one must describe a sufficient variety of species to reflect the variation within the genus. In this case, the specification discloses only a single representative species of the genus of claimed isolated polynucleotides, *i.e.*, SEQ ID NO:1. The specification fails to describe any additional representative species of the claimed genus. While MPEP § 2163 acknowledges that in certain situations "one species adequately supports a genus", it is also acknowledges that "[f]or inventions in an unpredictable art, adequate written description of a genus which embraces widely

variant species cannot be achieved by disclosing only one species within the genus". In the instant case, the recited genus of polynucleotides encompasses species that are widely variant in structure. As such, the single representative species of the genus of polynucleotides is insufficient to be representative of the attributes and features of *all* species encompassed by the claimed genus. Given the lack of description of a representative number of polynucleotides, the specification fails to sufficiently describe the claimed invention in such full, clear, concise, and exact terms that a skilled artisan would recognize that applicant was in possession of the claimed invention.

[14] Claim(s) 36-39 are rejected under 35 U.S.C. 112, first paragraph, because the specification, while being enabling for SEQ ID NO:1, does not reasonably provide enablement for the broad scope of polynucleotides consisting of *at least* 15 consecutive nucleotides of SEQ ID NO:1 for use as PCR primers or hybridization probes as broadly encompassed by the claims. The specification does not enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention commensurate in scope with these claims.

It is the examiner's position that undue experimentation would be required for a skilled artisan to make and/or use the entire scope of the claimed invention. Factors to be considered in determining whether undue experimentation is required are summarized in *In re Wands* (858 F.2d 731, 737, 8 USPQ2d 1400, 1404 (Fed. Cir. 1988)) as follows: (A) The breadth of the claims; (B) The nature of the invention; (C) The state of the prior art; (D) The level of one of ordinary skill; (E) The level of predictability in the art; (F) The amount of direction provided by the inventor; (G) The

existence of working examples; and (H) The quantity of experimentation needed to make or use the invention based on the content of the disclosure. See MPEP § 2164.01(a). The Factors most relevant to the instant rejection are addressed in detail below.

- The claims are overly broad in scope: As stated above, in view of the recitation of *at least*, the claims are so broad as to encompass *all* polynucleotides consisting of at least 15 contiguous nucleotides of SEQ ID NO:1. The broad scope of recited polynucleotides are not limited to fragments of SEQ ID NO:1 and instead broadly encompass polynucleotides that can be used as a PCR primer or hybridization probe for a nucleic acid encoding any acyl-CoA synthase polypeptide. The scope of claimed polynucleotides is not commensurate with the enablement provided by the disclosure with regard to the extremely large number of polynucleotides broadly encompassed by the claims. In this case the disclosure is limited to the isolated polynucleotide of SEQ ID NO:1.

- The lack of guidance and working examples: The specification provides only a single working example of the claimed polynucleotide, *i.e.*, the polynucleotide of SEQ ID NO:1. This working example fails to provide the necessary guidance for making the entire scope of polynucleotides.

- The high degree of unpredictability in the art: The nucleotide sequence of an encoding nucleic acid determines the corresponding encoded protein's structural and functional properties. Predictability of which changes can be tolerated in a PCR primer

or hybridization probe including nucleotide additions, deletions, and/or substitutions and obtain a nucleic acid by PCR or hybridization encoding polypeptide having the desired activity, *i.e.,* acyl-CoA synthase activity, is highly unpredictable.

- The state of the prior art supports the high degree of unpredictability: The state of the art provides evidence for the high degree of unpredictability in altering a polynucleotide sequence with an expectation that the encoded polypeptide will maintain the desired activity/utility. For example, Branden et al. ("Introduction to Protein Structure", Garland Publishing Inc., New York, 1991) teach "[p]rotein engineers frequently have been surprised by the range of effects caused by single mutations that they hoped would change only one specific and simple property in enzymes" and "[t]he often surprising results of such experiments reveal how little we know about the rules of protein stability... ...they also serve to emphasize how difficult it is to design *de novo* stable proteins with specific functions" (page 247). As a representative example of the teachings of Branden et al., Witkowski et al. (*Biochemistry* 38:11643-11650) teaches that a single amino acid substitution results in conversion of the parent polypeptide's activity from a beta-ketoacyl synthase to a malonyl decarboxylase (see e.g., Table 1, page 11647). Thus, the prior art acknowledges the unpredictability of altering a protein-encoding sequence with an expectation of obtaining a protein having a desired function and discloses that even a single substitution in a polypeptide's amino acid sequence may completely alter the function of a polypeptide.

- The amount of experimentation required is undue: While methods of generating variants of a given polynucleotide and methods of isolating homologous polynucleotides

are known in the art, it is not routine in the art to screen for *all* polynucleotides as encompassed by claims 36-37.

In view of the overly broad scope of the claims, the lack of guidance and working examples provided in the specification, the high degree of unpredictability as evidenced by the prior art, and the amount of experimentation required to make and use the full scope of the claimed polynucleotides, undue experimentation would be necessary for a skilled artisan to make and use the entire scope of the claimed invention. Thus, applicant has not provided sufficient guidance to enable one of ordinary skill in the art to make and use the claimed invention in a manner reasonably correlated with the scope of the claims. The scope of the claims must bear a reasonable correlation with the scope of enablement (*In re Fisher*, 166 USPQ 19 24 (CCPA 1970)). Without sufficient guidance, determination of having the desired biological characteristics is unpredictable and the experimentation left to those skilled in the art is unnecessarily, and improperly, extensive and undue. See *In re Wands* 858 F.2d 731, 8 USPQ2nd 1400 (Fed. Cir, 1988).

Biological Deposit

[15] It is noted that claims 30, 42, and 45 are drawn to a biological material, *i.e.*, a host cell comprising a novel vector having Accession Number DSM 13249. Applicants assert the claimed host cell has been deposited in accordance with the Budapest Treaty (see p. 18 of the specification). Further, applicants assert the host cell will be irrevocably

and without restriction or condition released to the public upon the issuance of a US patent (see p. 7 of the response filed May 12, 2003).

Citation of Relevant Art

[16] The art made of record and not relied upon is considered pertinent to applicant's disclosure. Pompejus et al. (US Patent 6,696,561) discloses a nucleic acid, SEQ ID NO:59, that encodes a polypeptide that is 100% identical to SEQ ID NO:2 (see Appendix A) and is 100% identical to nucleotides 159-2126 of SEQ ID NO:1 of the instant application (see Appendix B). Pompejus et al. claim domestic priority to US provisional application 60/141,031, filed June 25, 1999, which is before the effective US filing date of the instant application. However, the examiner can find no disclosure of the nucleic acid of SEQ ID NO:59 (denoted as RXA 00880) in provisional application 60/141,031. Applicants are advised that if SEQ ID NO:59 of Pompejus et al. is disclosed in the provisional application, Pompejus et al. may be applied as prior art against the pending claims.

Conclusion

[17] Status of the claims:

- Claims 25-27 and 29-46 are pending.
- Claims 25-27, 29, 31-35, 40-41, and 43-44 appear to be in a condition for allowance.
- Claims 30, 36-39, 42, and 45-46 are rejected.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to David Steadman, whose telephone number is (571) 272-0942. The Examiner can normally be reached Monday-Friday from 7:30 am to 5:00 pm. If attempts to reach the Examiner by telephone are unsuccessful, the Examiner's supervisor, Ponnathapura Achutamurthy, can be reached at (571) 272-0928. The FAX number for submission of official papers to Group 1600 is (703) 872-9306. Draft or informal FAX communications should be directed to (571) 273-0942. Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Art Unit receptionist whose telephone number is (703) 308-0196.

10-27-04

David J. Steadman, Ph.D.
Primary Examiner
Art Unit 1652

APPENDIX A

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RESULT 1
AR477603
LOCUS       AR477603               1968 bp    DNA     linear   PAT 14-MAY-2004
DEFINITION  Sequence 59 from patent US 6696561.
ACCESSION   AR477603
VERSION     AR477603.1  GI:47235364
KEYWORDS    .
SOURCE      Unknown.
  ORGANISM  Unknown.
            Unclassified.
REFERENCE   1  (bases 1 to 1968)
  AUTHORS   Pompejus,M., Kroger,B., Schroder,H., Zelder,O. and Haberhauer,G.
  TITLE     Corynebacterium glutamicum genes encoding proteins involved in
            membrane synthesis and membrane transport
  JOURNAL   Patent: US 6696561-A 59 24-FEB-2004;
FEATURES             Location/Qualifiers
     source          1. .1968
                     /organism="unknown"
                     /mol_type="genomic DNA"
ORIGIN

Alignment Scores:
Pred. No.:              1.75e-206      Length:          1968
Score:                  3156.00        Matches:         618
Percent Similarity:     100.00%        Conservative:    1
Best Local Similarity:  99.84%         Mismatches:      0
Query Match:            99.91%         Indels:          0
DB:                     6              Gaps:            0

US-09-855-750A-2 (1-619) x AR477603 (1-1968)

Qy          1 MetAsnLeuThrMetThrSerProAsnThrLeuGlnGluTyrThrGluProAlaLysTyr 20
              :::||||||||||||||||||||||||||||||||||||||||||||||||||||||||
Db         89 TTGAATTTGACCATGACTTCACCTAATACCCTGCAGGAATACACTGAACCTGCCAAGTAC 148

Qy         21 ThrIleGlyGluSerGluThrCysLeuThrAlaLeuLeuAspGlnIleLysThrArgPro 40
              ||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||
Db        149 ACCATCGGAGAATCTGAAACCTGCCTGACCGCCCTTCTAGATCAGATTAAGACTCGACCT 208

Qy         41 TyrGlyValLeuPheSerLysProAlaAsnTyrGluTrpValAsnValThrAlaLysGlu 60
              ||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||
Db        209 TACGGAGTTTTGTTCAGCAAGCCTGCCAACTATGAGTGGGTGAATGTAACTGCCAAAGAA 268

Qy         61 PheGlnAspGluValPheAlaValAlaLysGlyIleIleSerValGlyValGluGlnGly 80
              ||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||
Db        269 TTTCAGGACGAGGTTTTTGCGGTTGCAAAAGGAATTATTTCAGTCGGCGTAGAGCAGGGA 328

Qy         81 AspArgValAlaLeuLeuSerAsnThrArgTyrGluTrpAlaValLeuAspPheAlaIle 100
              ||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||
Db        329 GACCGTGTCGCGCTGCTGTCCAATACTCGCTATGAGTGGGCTGTGCTTGATTTCGCTATC 388

Qy        101 TrpAlaAlaGlyAlaValSerValProIleTyrSerSerSerSerLeuSerGlnIleGlu 120
              ||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||
Db        389 TGGGCCGCTGGCGCAGTGAGCGTGCCTATCTACAGCTCCTCTTCACTGTCCCAAATTGAG 448

Qy        121 TrpIleIleGluAspSerGlyAlaValLeuAlaIleThrGluThrProAspHisThrAsp 140
              ||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||
Db        449 TGGATCATTGAGGATTCCGGCGCTGTTTTGGCCATTACCGAAACCCCTGATCATACCGAC 508

Qy        141 LeuMetLysAsnLeuValIleGlyGluAspGlyThrProAlaIleLysGlySerProSer 160
              ||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||
Db        509 TTGATGAAGAACCTGGTCATCGGTGAAGACGGAACTCCAGCGATTAAGGGTTCACCTTCC 568

Qy        161 LysLeuArgArgIleLeuGluIleAsnSerSerAlaLeuGluThrLeuLysPheGluGly 180
              ||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||
Db        569 AAGCTGCGCCGCATTCTAGAGATCAACTCTTCGGCGTTGGAGACCTTGAAGTTTGAGGGC 628
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Qy       181 ArgGluLeuSerAspGluLeuValTrpGluArgIleHisAlaThrLysAlaAlaAspLeu 200
            ||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||
Db       629 CGCGAGCTTTCTGATGAGCTGGTGTGGGAACGCATTCATGCAACCAAGGCCGCTGACCTG 688

Qy       201 AlaSerLeuValTyrThrSerGlyThrThrGlyArgProLysGlyCysGluLeuSerHis 220
            ||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||
Db       689 GCGTCTTTGGTGTACACCTCTGGCACAACTGGTAGGCCGAAGGGCTGCGAGTTGTCCCAC 748

Qy       221 TyrHisTrpLeuAlaGluValArgAlaLeuIleThrAsnAspIleGlyAlaIleAlaMet 240
            ||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||
Db       749 TACCACTGGTTGGCTGAGGTCCGAGCGCTGATCACCAATGACATCGGAGCGATCGCGATG 808

Qy       241 ProGlySerArgLeuLeuThrPheLeuProLeuAlaHisValLeuAlaArgAlaValHis 260
            ||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||
Db       809 CCAGGTTCAAGGTTGCTCACCTTCCTTCCTTTGGCGCACGTTCTTGCTCGCGCAGTGCAC 868

Qy       261 LeuAlaPheAlaValThrGlyAlaThrGlnSerHisTrpSerAspPheSerThrLeuThr 280
            ||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||
Db       869 TTGGCCTTCGCTGTCACCGGTGCAACCCAGTCCCACTGGTCTGATTTCAGCACCCTTACT 928

Qy       281 LeuGluLeuGlnArgSerArgProAsnLeuIleLeuGlyValProArgValPheGluLys 300
            ||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||
Db       929 TTGGAACTGCAGCGTTCCCGCCCGAACCTGATTTTGGGTGTTCCACGCGTGTTTGAAAAG 988

Qy       301 ValArgAsnAlaAlaAlaAlaAsnAlaAlaAspGlyGlyAlaIleLysArgIleMetPhe 320
            ||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||
Db       989 GTCCGCAACGCCGCTGCTGCTAATGCTGCTGACGGTGGCGCAATCAAGCGCATCATGTTT 1048

Qy       321 GluArgAlaGluLysAlaAlaIleGluTyrSerMetAlaLeuAspThrAlaGluGlyPro 340
            ||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||
Db      1049 GAGCGTGCCGAAAAGGCGGCCATTGAATACTCCATGGCTCTTGATACTGCAGAAGGCCCA 1108

Qy       341 SerLysSerGlnValMetAlaHisLysAlaPheAspLysLeuValTyrSerLysIleArg 360
            ||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||
Db      1109 AGCAAGTCCCAGGTTATGGCACATAAAGCGTTTGACAAGCTGGTGTACTCCAAGATCCGT 1168

Qy       361 AlaAlaValGlyGlyAspValGlnTyrAlaIleThrGlyGlySerAlaMetGlyGlnGlu 380
            ||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||
Db      1169 GCAGCTGTCGGTGGCGATGTGCAGTACGCCATCACCGGTGGTTCAGCGATGGGGCAGGAG 1228

Qy       381 LeuLeuHisPhePheArgGlyValGlyMetThrIleTyrGluGlyTyrGlyLeuThrGlu 400
            ||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||
Db      1229 CTGCTGCACTTCTTCCGCGGTGTGGGCATGACCATCTACGAAGGTTATGGTCTGACGGAA 1288

Qy       401 SerAlaAlaAlaAlaAlaValAspPheThrAspGlnLysIleGlyThrValGlyLysPro 420
            ||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||
Db      1289 TCTGCGGCTGCTGCAGCGGTGGACTTCACTGATCAAAAGATCGGCACTGTGGGTAAGCCG 1348

Qy       421 MetGlyGlyMetThrIleLysIleAsnGluAspGlyGluIleMetLeuLysGlyGluMet 440
            ||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||
Db      1349 ATGGGTGGCATGACCATCAAGATCAATGAAGATGGCGAAATCATGCTAAAAGGCGAGATG 1408

Qy       441 LeuPheGlnGlyTyrTrpAsnAsnProGluAlaThrAlaGluAlaLeuHisAspGlyTrp 460
            ||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||
Db      1409 TTGTTCCAGGGATATTGGAACAACCCAGAAGCCACAGCAGAAGCCCTCCACGACGGTTGG 1468

Qy       461 PheAsnThrGlyAspLeuGlyGluLeuLeuGluSerGlyHisLeuValIleThrGlyArg 480
            ||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||
Db      1469 TTCAACACCGGCGATCTGGGTGAGCTGTTGGAGTCTGGACACCTGGTGATCACCGGACGT 1528

Qy       481 LysLysAspLeuIleValThrAlaGlyGlyLysAsnValSerProGlyProMetGluAsp 500
            ||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||
Db      1529 AAGAAAGATCTGATCGTGACCGCGGGCGGCAAGAACGTTTCCCCAGGACCCATGGAAGAC 1588

Qy       501 IleIleArgAlaHisProLeuValSerGlnAlaMetValValGlyAspGlyLysProPhe 520
            ||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||
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Db       1589 ATCATCCGCGCACACCCACTGGTCAGCCAGGCCATGGTGGTGGGCGATGGTAAACCATTC 1648

Qy        521 ValGlyLeuLeuValThrLeuAspProAspMetLeuLysArgTrpLysLeuAsnHisAsn 540
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Db       1649 GTTGGCCTGCTGGTGACCTTGGATCCAGATATGTTGAAGCGGTGGAAGCTGAACCACAAC 1708

Qy        541 IleAlaGluSerArgThrValSerGluIleAlaThrAspProAlaLeuArgAlaGluIle 560
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Db       1709 ATTGCGGAATCCCGCACGGTTTCTGAGATTGCTACTGATCCTGCACTGCGTGCGGAAATC 1768

Qy        561 GlnAspAlaValAsnAsnAlaAsnAlaThrValSerHisSerGluAlaIleLysArgPhe 580
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Qy        581 TyrIleLeuAspArgAspLeuThrGluGluAlaAspGluLeuThrProThrLeuLysVal 600
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Db       1829 TACATCCTTGATCGCGACCTGACCGAGGAAGCCGACGAGCTGACCCCAACGCTGAAGGTC 1888

Qy        601 LysArgAsnValValValArgArgTyrAlaAspAlaIleAspHisIleTyrAsnArg 619
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APPENDIX B

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RESULT 8
AR477603
LOCUS       AR477603               1968 bp    DNA     linear   PAT 14-MAY-2004
DEFINITION  Sequence 59 from patent US 6696561.
ACCESSION   AR477603
VERSION     AR477603.1  GI:47235364
KEYWORDS    .
SOURCE      Unknown.
  ORGANISM  Unknown.
            Unclassified.
REFERENCE   1  (bases 1 to 1968)
  AUTHORS   Pompejus,M., Kroger,B., Schroder,H., Zelder,O. and Haberhauer,G.
  TITLE     Corynebacterium glutamicum genes encoding proteins involved in
            membrane synthesis and membrane transport
  JOURNAL   Patent: US 6696561-A 59 24-FEB-2004;
FEATURES             Location/Qualifiers
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                     /organism="unknown"
                     /mol_type="genomic DNA"
ORIGIN

  Query Match             85.6%;  Score 1968;  DB 6;  Length 1968;
  Best Local Similarity   100.0%;  Pred. No. 0;
  Matches 1968;  Conservative    0;  Mismatches    0;  Indels    0;  Gaps    0;

Qy        159 TCCATGTGGTTAAAGATATGCCTAAAGATCTGACCAAAAACGTGACTAAAGACGTGACGA 218
              ||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||
Db          1 TCCATGTGGTTAAAGATATGCCTAAAGATCTGACCAAAAACGTGACTAAAGACGTGACGA 60

Qy        219 CACAAGTACAGCCAAATTAAAGGAAAGGTTGAATTTGACCATGACTTCACCTAATACCCT 278
              ||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||
Db         61 CACAAGTACAGCCAAATTAAAGGAAAGGTTGAATTTGACCATGACTTCACCTAATACCCT 120

Qy        279 GCAGGAATACACTGAACCTGCCAAGTACACCATCGGAGAATCTGAAACCTGCCTGACCGC 338
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Db        121 GCAGGAATACACTGAACCTGCCAAGTACACCATCGGAGAATCTGAAACCTGCCTGACCGC 180

Qy        339 CCTTCTAGATCAGATTAAGACTCGACCTTACGGAGTTTTGTTCAGCAAGCCTGCCAACTA 398
              ||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||
Db        181 CCTTCTAGATCAGATTAAGACTCGACCTTACGGAGTTTTGTTCAGCAAGCCTGCCAACTA 240

Qy        399 TGAGTGGGTGAATGTAACTGCCAAAGAATTTCAGGACGAGGTTTTTGCGGTTGCAAAAGG 458
              ||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||
Db        241 TGAGTGGGTGAATGTAACTGCCAAAGAATTTCAGGACGAGGTTTTTGCGGTTGCAAAAGG 300

Qy        459 AATTATTTCAGTCGGCGTAGAGCAGGGAGACCGTGTCGCGCTGCTGTCCAATACTCGCTA 518
              ||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||
Db        301 AATTATTTCAGTCGGCGTAGAGCAGGGAGACCGTGTCGCGCTGCTGTCCAATACTCGCTA 360

Qy        519 TGAGTGGGCTGTGCTTGATTTCGCTATCTGGGCCGCTGGCGCAGTGAGCGTGCCTATCTA 578
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Db        361 TGAGTGGGCTGTGCTTGATTTCGCTATCTGGGCCGCTGGCGCAGTGAGCGTGCCTATCTA 420

Qy        579 CAGCTCCTCTTCACTGTCCCAAATTGAGTGGATCATTGAGGATTCCGGCGCTGTTTTGGC 638
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Qy        639 CATTACCGAAACCCCTGATCATACCGACTTGATGAAGAACCTGGTCATCGGTGAAGACGG 698
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Db        481 CATTACCGAAACCCCTGATCATACCGACTTGATGAAGAACCTGGTCATCGGTGAAGACGG 540

Qy        699 AACTCCAGCGATTAAGGGTTCACCTTCCAAGCTGCGCCGCATTCTAGAGATCAACTCTTC 758
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Db        541 AACTCCAGCGATTAAGGGTTCACCTTCCAAGCTGCGCCGCATTCTAGAGATCAACTCTTC 600

Qy        759 GGCGTTGGAGACCTTGAAGTTTGAGGGCCGCGAGCTTTCTGATGAGCTGGTGTGGGAACG 818
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Db        601 GGCGTTGGAGACCTTGAAGTTTGAGGGCCGCGAGCTTTCTGATGAGCTGGTGTGGGAACG 660

Qy        819 CATTCATGCAACCAAGGCCGCTGACCTGGCGTCTTTGGTGTACACCTCTGGCACAACTGG 878
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Db        721 TAGGCCGAAGGGCTGCGAGTTGTCCCACTACCACTGGTTGGCTGAGGTCCGAGCGCTGAT 780

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Qy       1059 CCACTGGTCTGATTTCAGCACCCTTACTTTGGAACTGCAGCGTTCCCGCCCGAACCTGAT 1118
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Db        961 TTTGGGTGTTCCACGCGTGTTTGAAAAGGTCCGCAACGCCGCTGCTGCTAATGCTGCTGA 1020

Qy       1179 CGGTGGCGCAATCAAGCGCATCATGTTTGAGCGTGCCGAAAAGGCGGCCATTGAATACTC 1238
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Qy       1239 CATGGCTCTTGATACTGCAGAAGGCCCAAGCAAGTCCCAGGTTATGGCACATAAAGCGTT 1298
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Qy       1299 TGACAAGCTGGTGTACTCCAAGATCCGTGCAGCTGTCGGTGGCGATGTGCAGTACGCCAT 1358
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Db       1141 TGACAAGCTGGTGTACTCCAAGATCCGTGCAGCTGTCGGTGGCGATGTGCAGTACGCCAT 1200

Qy       1359 CACCGGTGGTTCAGCGATGGGGCAGGAGCTGCTGCACTTCTTCCGCGGTGTGGGCATGAC 1418
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Qy       1419 CATCTACGAAGGTTATGGTCTGACGGAATCTGCGGCTGCTGCAGCGGTGGACTTCACTGA 1478
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Qy       1779 CATGGTGGTGGGCGATGGTAAACCATTCGTTGGCCTGCTGGTGACCTTGGATCCAGATAT 1838
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Qy       1839 GTTGAAGCGGTGGAAGCTGAACCACAACATTGCGGAATCCCGCACGGTTTCTGAGATTGC 1898
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Qy       1959 GTCTCATTCAGAGGCGATCAAGCGGTTCTACATCCTTGATCGCGACCTGACCGAGGAAGC 2018
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